

A NEW SPECIES OF *CULEX* FROM NEW GUINEA¹
(Diptera, Culicidae)

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Among collections of adult mosquitoes taken with a net in woods at an approximate elevation of 1,000 feet above sea level on the slopes of the Cyclops Mountains, were males and females of a *Culex* that did not agree with descriptions of other Australasian species of this genus. Later, some small green larvae were collected from leaf axils of sago palm in a sago swamp near Lake Sentani, (approximately 250 feet above sea level), and adults similar to those from the Cyclops Mountains were bred from these larvae.

Culex(?Neoculex) *binigrolineatus*, new species

ADULT FEMALE. A medium-sized mosquito with dark wings and tarsi; white hind femora, and a strikingly ornamented scutum. Wing 3 mm.

Head:—Proboscis and labella black. Palpi black, about one-fourth the length of the proboscis. Clypeus bare. Antennae slightly longer than proboscis; tori bare, ochreous; flagellar segments black, with pale pubescence and black whorl-hairs. Vertex with a large central area of narrow, white, curved scales extending forward between the eyes; white upright forked scales over all of central white area, black upright forked scales at the sides of this area; a patch of broad flat white scales laterally, and flat white scales along eye margins extending upwards to the lower edge of the central patch of white curved scales; orbital bristles pale above, black below.

Thorax:—Prothoracic lobes bare, with several long black bristles. Posterior pronotum bare, with several long black bristles near posterior border. Mesonotum (Fig. 4) pale-scaled; a narrow, bare, black stripe on each side of mid-dorsal line, beginning at the anterior margin and the two converging posteriorly into the bare prescutellar area; two short bare dark stripes extending from the lateral lobes of the scutellum to a short distance before wing roots; pale scales white or yellowish, those between submedian dark stripes pale anteriorly, shading into curved black scales posteriorly, the inner border of dark median stripes lined with black scales; prescutellar space and lateral margins of mesonotum dark, bare, a few small black scales before wing root. Mesonotum with several rows of long, black bristles, a denser patch above wing root. Mid-lobe of scutellum with a patch of narrow curved pale scales and several marginal bristles; a clump of long black bristles on each lateral lobe. Postnotum dark brown centrally, pale at lateral margins. Propleuron pale brown, with two long bristles. Post-spiracular area pale brown; sternopleuron pale or greenish, darker above; mesepimeron and meron pale green. Pre-alar bristles black; a

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row of pale bristles along posterior border of sternopleuron; one lower and two or three pale upper mesepimeral bristles. Pleuron without scale patches.

Wings.—Scales all dark, those on costa, subcosta, and vein 1 broad, appressed; smaller and narrower flat scales on veins 3 and 5; stem of vein 2 with long, narrow, curved scales, those on the branches broader and denser distally; long, narrow, curved scales on stem of vein 4 and small, flat, appressed scales on the branches; vein 6 with very small, narrow, flat scales on basal half, and longer, narrow curved ones on distal half. First fork cell about one and one-half times the length of the stem; base of first fork cell slightly more basal than that of second fork cell. Anterior and posterior cross veins well separated. Halteres pale.

Legs.—Coxae and trochanters pale greenish; fore coxa with broad, flat, dusky scales; mid coxa with a few flat pale scales; all coxae with several long pale bristles. Fore femur white basally, dark distally on anterior surface, a pale stripe on posterior surface to the apex; mid femur white at base, dark distally on dorsal surface, pale ventrally; hind femur white except at apex. All tibiae and tarsi dark, without pale markings at the joints; in different lights the tibiae and tarsal segments I appear pale-scaled. First hind tarsal segment longer than the tibia.

Abdomen.—Tergite I bare except for a small median patch of flat black scales; all other tergites densely clothed with black scales; basal lateral white spots on segments VI, VII, and sometimes on IV and V, extending medially as basal bands on tergite VII, and occasionally on V and VI; these bands narrowing medially, often to a single row of scales, but on segments VI and VII they may be very broad; tergite VIII dark. Lateral spot when present on tergite IV composed of only a few pale scales; rarely a few scales basally on tergite III also. Pale bristles arising over all of surface of tergite I; a row of similar bristles at the apices of all other tergites. Venter green or grey, clothed with pale bristles; distal segments with broad flat white scales, becoming progressively denser towards the apex.

ADULT MALE. Very similar to female. Proboscis with a group of long bristles ventrally before the middle. Antennae slightly shorter than proboscis. Palpi longer than the proboscis by the length of the fifth segment; a few pale, unmodified bristles arranged in a row on ventral surface of third segment; fourth and fifth segments upturned, with some long black bristles. Remainder as in female.

Hypopygium (Figs. 6, 9, 10, 11, 12, and 13).—Sidepiece conical, without scales, a number of long hairs on outer and dorsal surfaces. Subapical lobe small, with two long stout spines and several smaller setae. Clasper with small papillated hair on inner surface; terminal spine short, broad. Lateral plates of mesosome with a row of dorsally and laterally projecting stout denticles on inner edge of upper arm. In lateral aspect the denticles appear in a semi-circular row, or as an uneven row with several teeth at apex, one or two in the middle, and a prominence with several teeth below. Tenth sternites heavily sclerotized, the inner edge with a row of irregular denticles, the apex with several stout spines; basal arm short, curved. Tenth tergites broad, very lightly sclerotized. Ninth tergite simple, without lobes, evenly clothed with long hairs.

LARVA. Head (Figs. 5 and 8):—Head distinctly produced laterally, slightly broader than long; lightly pigmented. Antenna tubular, only slightly tapered beyond antennal hair tuft, clear, occasionally lightly pigmented over apical two-thirds; scattered, clear, acutely tapered spines basally, a few occurring along shaft nearly to hair tuft; antennal hair tuft at apical three-fifths, consisting of 6 to 8 long, finely plumose hairs, a minute clear spine at the base of the tuft; 3 long hairs, one short spine and a short, stout, rodlike appendage directly at the apex of the antenna. Major head hairs pigmented, stout, finely plumose and extending apically about as far as tip of antenna; ante-antennal tuft 4- to 7-branched, usually 5; lower and upper head hairs 2- to 3-branched, usually 3. Remaining head hairs elongate, fine, unpigmented, sparsely and indistinctly feathered; sub-antennal hair 1- to 3-branched, average 2; orbital hair 1- to 4-branched, average 3; outer occipital 3 to 6, average 5; inner occipital 1 to 4, average 2; posterior clypeal 1- to 3-branched, average 2; outer clypeal extremely minute, single. Preclypeal spine pigmented, slender, acutely tapered. Mentum evenly triangular with 9 to 11 (average 10) subequal teeth laterally and one stout protruding central tooth.

Thorax:—Outstanding hairs extremely long, the main mesothoracic hair extending well beyond the head.

Abdomen (Figs. 7a, b, and c):—Dorso-lateral hair of first two segments well developed, usually 2-branched; lateral hair shorter, generally single or double, the hair on VI equalling or exceeding those of I and II in length. Comb scales approximately 30 in number (observed range 26-43), arranged in broad triangular patch of about 3 rows, with a stout apical thorn and fine lateral fringe. Lateral hairs of VIII well developed, finely plumose; first (most dorsal) and second hairs single; third generally 6-branched, observed range 6 to 10; fourth hair single and fifth double. Siphon strongly pigmented, noticeably curved from base to apex, slightly tapered, widest at basal one-fifth; siphonal index approximately 3.5 to 1; acus well developed; 3 pairs of strong, elongate (somewhat over one-half the length of the siphon), finely plumose, subventral, siphonal hair tufts, each 3-branched, observed range 3 to 5; pecten of 11-12 teeth, observed range 9-15, smaller and more closely spaced basally, teeth broad, acutely tapered with a fringe of fine spines; apico-dorsal hair short, stout, directed basad; dorso-lateral valve spine stout, recurved. Anal segment longer than wide. Anal plate well pigmented, incomplete subventrally, the surface rugose with short transverse lines of minute spinules; latero-caudal margin with a patch of well developed spines; lateral hair stout, single, finely plumose and exceeding the plate in length; dorsal brush exceeding the siphon by nearly twice its length, the inner hair double, the outer single and more strongly developed; ventral brush consisting of a single pair of short, stout hairs, no barred area; anal gills broadly lanceolate, the upper pair at least twice the length of the anal plate.

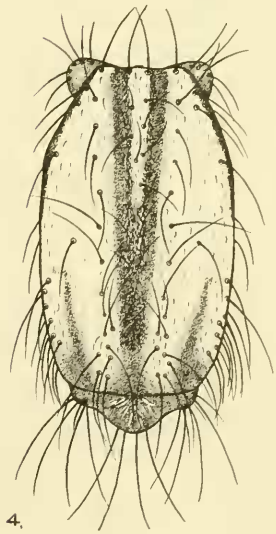
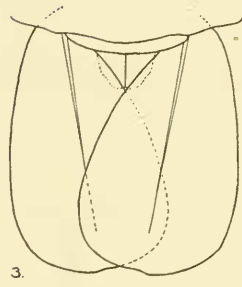
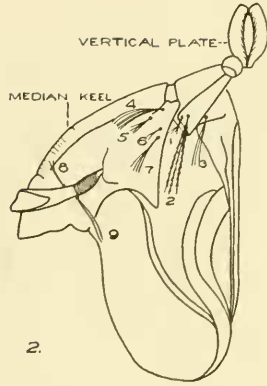
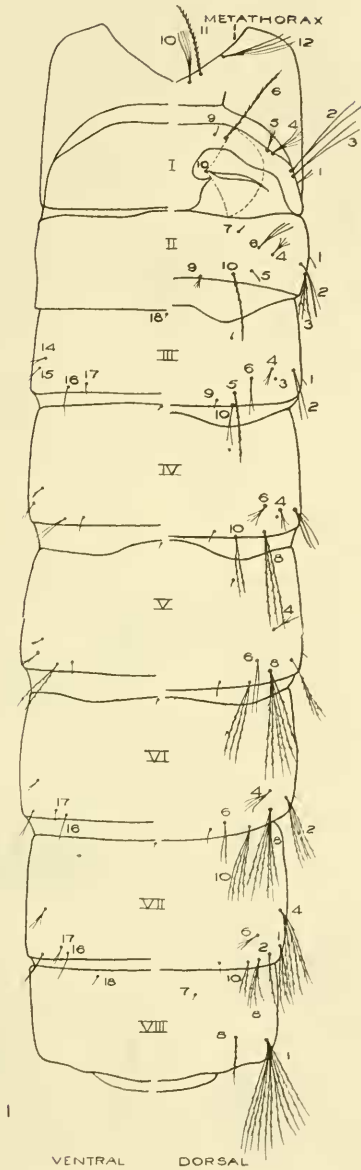
PUPA. Cephalothorax (Fig. 2):—Basal third of trumpet darkly pigmented, transversely striated, slightly enlarged medially; remainder of trumpet pale, increasing slightly in diameter to tip, apical notch shallow, basal notch deep and averaging slightly more than one-third the length of the trumpet. Dorsal area of cephalothorax from anterior end of median keel along base of trumpets to the upper portion of the wing covers darkly pigmented; wing covers partially

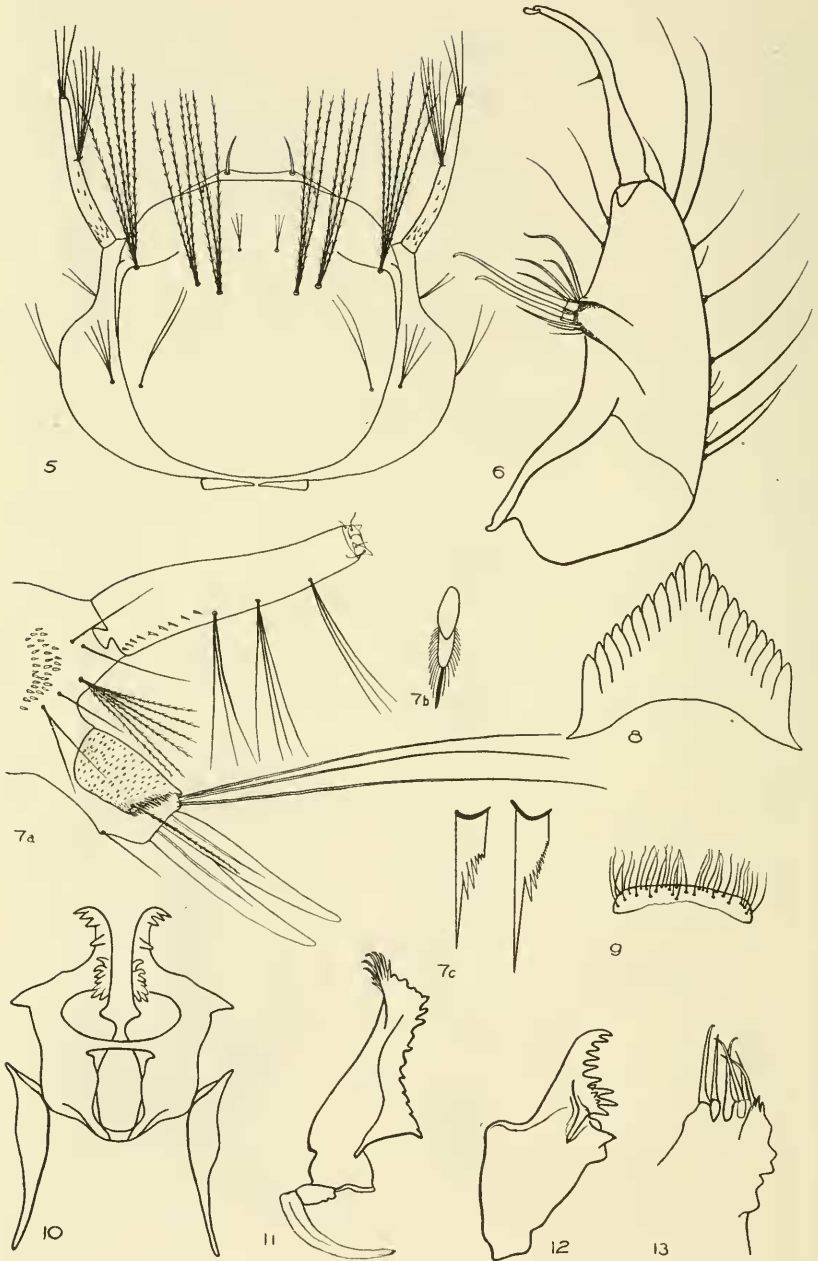
pigmented along medio-dorsal line; remainder of cephalothorax pale. Vertical plate notched apically, median area membranous, ratio of length to width varies from 1.1 to 2.5:1. Hair 2 prominent, nearly twice as long as any other of the cephalothoracic hairs, 3- to 4-branched, finely plumose; hair 11 (on meta-thorax) single, finely plumose, nearly spine-like.

Abdomen (Figs. 1 and 3):—Well pigmented, segment II being markedly so. Nearly all of dorsal abdominal hairs finely plumose; hair 6 of segment I single, strongly developed; hair 10 of II single; hair 10 of III single, rarely double; hair 8 of IV 3- to 4-branched, hair 10 2- to 4-branched, shorter than 8; hair 8 of V 3- to 5-branched, prominent, hair 10 2- to 4-branched; hair 8 of VI 4- to 7-branched, exceedingly well developed, hair 10 1- to 4-branched; hair 8 of VII 3- to 7-branched; hair 1 of VIII 9- to 14-branched, strongly developed, fan-like. Paddle without marginal fringe or apical hairs, only basal one-third of lateral margin sclerotized, ratio of length to width approximately 1.7 : 1.

TYPES. *Holotype*:—♂, with larval and pupal skins and dissected genitalia, elevation approximately 250 feet, Lake Sentani, Hollandia, Dutch New Guinea, 2 March 1945 (K. L. Knight). *Allotype*:—♀, with larval and pupal skins, data same as for holotype. *Paratypes* (7 ♂♂, 7 ♀♀):—3 ♂♂ with larval and pupal skins, 3 ♀♀ with larval and pupal skins; 2 ♀♀ with pupal skins; 1 ♂ with pupal skin; 4 larval skins and 3 whole larvae, elevation approximately 250 feet, Lake Sentani, Hollandia, Dutch New Guinea, 2 March 1945 (K. L. Knight); 2 ♀♀ and 3 ♂♂ collected by net over aseepage area and along damp rock wall in jungle, elevation approximately 1000 feet, on the slopes of the Cyclops Mountains, Hollandia, Dutch New Guinea, 17 January to 16 March 1945 (L. E. Rozeboom, J. L. Laffoon, and C. Schultz). *Holotype* and *allotype* to be deposited in U. S. National Museum. *Paratypes* to be deposited in U. S. National Museum, University of Sydney, and the Johns Hopkins School of Hygiene and Public Health.

TAXONOMIC DISCUSSION. The exact subgeneric position of this species is difficult to determine. However, it appears to be most closely related to the subgenus *Neoculex*, which it resembles in having a simple mesosome, consisting of a pair of tuberculate plates joined by a bridge at the middle and at the base. This character, as well as the absence of a large, dense tuft of spines at the apex of the tenth sternite would seem to exclude it from the subgenus *Culex*. Except for the lack of specialized hairs on the ventral surfaces of the male palpi, the species would enter the subgenus *Culiciomyia* rather well. The larva differs from all known species of the genus *Culex* in possessing only a single pair of ventral hairs on the anal segment.





Edwards (1932)³ divides the *Neoculex* into three groups of which this species is most closely related to Group A or *apicalis* Group. However, it differs from his definition of this group in lacking apical markings on the abdominal tergites, but Edwards includes several species in the group which also lack apical pale markings. In 1941 Edwards⁴ recognized five groups of *Neoculex*, to none of which the species can be referred definitely. However, it appears to be related most closely to Group B (*Neoculex* s. str.), although these mosquitoes are without obvious thoracic ornamentation.

Of the Australasian and Oriental species of *Neoculex*, *C. fergusonii* Taylor and *C. nematoides* D. & S. differ from *C. binigrolineatus* in having apical abdominal bands; *C. brevipalpis* Giles and *C. tenuipalpis* Barraud in having short palps in the male; *C. pseudomelanoconia* in lacking abdominal bands and a mesepimeral bristle; *C. crassistylus* Brug and *C. simplicornis* Edw. in having different scutal markings and in possessing a leaf on the subapical lobe of the sidepiece. No description was available for *tricuspis* Edwards (Sunda Islands).

EXPLANATION OF PLATES

PLATE I

- Figure 1. Metanotum and abdominal segments I-VIII of pupa.
 Figure 2. Cephalothorax (cast skin) of pupa.
 Figure 3. Segment VIII and paddles of pupa.
 Figure 4. Dorsal aspect of anterior prothoracic lobes, mesonotum and scutellum of adult.

PLATE II

- Figure 5. Dorsal aspect of larval head.
 Figure 6. Sidepiece of male genitalia.
 Figure 7. a. Lateral aspect of larval terminal segments. b. Comb scale.
 c. Pecten teeth.
 Figure 8. Dorsal aspect of mentum.
 Figure 9. Ninth tergite of male genitalia.
 Fig. 10. Undissected mesosome of male genitalia.
 Fig. 11. Tenth sternite.
 Figure 12. Dissected lateral plate of mesosome. Lateral aspect.
 Figure 13. Lateral aspect of apex of 10th sternite.

³ Edwards, F. W. 1932. Genera Insectorum. Culicidae. Fasc. 173, pp. 1-258. F. Wytzman, Brussels.

⁴ Edwards, F. W. 1941. Mosquitoes of the Ethiopian Region. 3. Culicid adults and pupae. 499 pp. British Museum.